



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL ENVIRONMENTAL SATELLITE, DATA,  
AND INFORMATION SERVICE  
Washington, D.C. 20233

Office of Radio Frequency Management  
Room 3332, Federal Office Bldg. #4  
Washington, D.C. 20233

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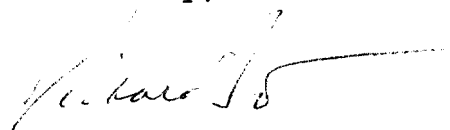
Office of the Secretary,  
Federal Communications Commission  
Washington, D.C. 20554

Ref: ET Docket No. 93-59  
RM-8092

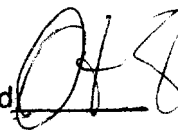
To the Commission:

Attached please find the comments of the National Oceanic and Atmospheric Administration, United States Department of Commerce, in response to the Commission's Notice of Proposed Rulemaking on Wind Profilers at 449 Mhz and 915 MHz.

Sincerely,

  
Richard Barth  
Director

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FEDERAL COMMUNICATIONS COMMISSION  
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In the Matter of )

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)  
) Amendment of Section 2.106 of  
) the Commission's Rules to  
) Allocate Spectrum for  
) Wind Profiler Radar Systems  
)

ET Docket No. 93-59  
RM-8092

## COMMENTS

of the

National Oceanic and Atmospheric Administration

The National Oceanic and Atmospheric Administration (NOAA), in the Department of Commerce, has for many years built and tested wind profiling radars (profilers). NOAA currently operates a Wind Profiler Demonstration Network (WPDN), consisting of approximately 30 profiler sites, built so NOAA could determine their value to meteorology. Several years of WPDN operation have shown that profilers do, in fact, live up to their promise of providing frequent, accurate and reliable measurements of wind profiles. These data have proven to be of great value in the diagnosis and prediction of a broad variety of potentially hazardous meteorological phenomena.

For profilers to meet NOAA's need for a real-time operational system, they must be deployed in a network covering the entire country. NOAA plans to build a national network of 200-500 profilers based on experience gained from the

WPDN. Data from that network, in combination with other NOAA observing systems, will substantially aid short range prediction of the timing and intensity of severe local storms, major winter storms and high wind events. Aviation, agriculture, marine and other weather sensitive activities will benefit through improved wind, precipitation and temperature forecasts as a result of the deployment of a national wind profiler network.

**The need for non-Government profilers on 449 MHz**

The building of a non-Government profiler network is unlikely because the data from NOAA's network will, like all NOAA data, be available to the public. The high costs of constructing such a network make it even more unlikely. While individual profilers may be needed for research purposes, they will likely be operated under experimental license and not require an allocation. It is envisioned that most privately owned profilers will use the 915 MHz band, both out of cost considerations (915 MHz profilers are considerably less expensive) and because their applications would require additional low-altitude resolution not available with the two MHz bandwidth which the Commission proposes to make available at 449 MHz. If public responses to the Commission's Notice of Proposed Rulemaking (NPRM) should indicate that there exists a need for a non-Government profiler allocation at 449 MHz, it should be made secondary to protect Government operations.

## **Protection of existing operations**

### **Government operations**

Coordination among Government agencies is the province of the Interdepartment Radio Advisory Committee (IRAC) and the National Telecommunications and Information Administration (NTIA). Sections of the proposed footnote which protect Federal systems from each other are the result of coordination among interested parties in the IRAC and should be incorporated verbatim in the Commission's Rules.

### **Non-Government profilers**

The Commission should coordinate license applications for non-Government profilers through the IRAC's Frequency Assignment Subcommittee (FAS) in order to protect military and other Government systems. Government profilers will be coordinated in this same manner.

### **Technical Standards**

Experimental operation has demonstrated that profilers can have vastly different degrees of compatibility with their electronic environment. To minimize interference with military radars, with other profilers, with radio amateurs and with systems operating above 450 MHz, it is important that all profilers meet stringent but necessary standards for emissions, antenna patterns and other technical characteristics. Standards of this sort are already in place for other

types of Government radar. It is essential that profilers being operated by the private sector meet the same standards as the Government imposes on itself.

#### Amateur radio repeaters

We believe the proposed footnote fully serves the needs of the amateur community. As the NPRM points out, a number of techniques are available to minimize interference between profilers and amateur radio operations. The proposed 120 day minimum advance notice will provide ample opportunity for repeater operators to contact the appropriate profiler operator and initiate a cooperative effort to provide compatibility.

We note that some repeaters are registered with the ARRL which, at the request of the operator, do not appear in the League's repeater directory. We anticipate that the League will provide information on all repeaters in the 448-450 MHz band of which it is aware, whether or not they are in the directory, subject to Commerce providing suitable protection for the information. This will ensure that all repeaters of which ARRL is aware will be included in the coordination process.

We consider it unnecessary at this time to create an amateur repeater exclusion zone around NOAA profilers. Rather, we would prefer to see the creation of a coordination zone, much like that which exists around certain military radars,

within which establishing a new amateur repeater would require prior approval of the appropriate coordinator to ensure that harmful interference will not be caused to the profiler. This coordination process would serve to make the repeater operator familiar with the technical characteristics of profilers, and enable him to plan his installation so as to optimize its performance while minimizing the likelihood of interference. The coordination process might involve the imposition of a combination of limits on the repeater's location or power, antenna gain or directionality, etc. so as to protect the profiler while minimally disrupting the repeater's operation.

The details of the proposed coordination between ARRL and the Department of Commerce have not yet been completely established. However, NOAA does not anticipate initiation of a nationwide profiler network until some time after 1996, so sufficient time exists for appropriate planning.

#### Systems in adjacent bands

Assuming adequate off-frequency rejection in the design of Private Land Mobile Radio System (PLMRS) and Remote Pickup (RPU) systems operating above 450 MHz, we believe on the basis of the tests run by NTIA that significant interference is likely to be minimal between profilers and ground-based systems. In the case of airborne RPU systems, which most often operate in and around urban areas, interference will be rare because profilers will be installed mostly in

rural areas. In the event that an airborne RPU must be operated in the vicinity of a profiler, any interference is likely to be transitory.

**Notice of Inquiry: Profilers on 915 MHz**

As noted in the NPRM, the performance of wind profilers is critically dependent on their operating frequency. Lower frequencies are necessary to obtain data from higher altitudes, while the greater bandwidths available at higher frequencies permit improved resolution at lower altitudes, where it is most needed. If a 915 MHz allocation were limited to a 2 MHz bandwidth, its low-level resolution would

to the ground while at the same time being able to reach acceptable altitudes above ground.

There will, however, be times when low-altitude resolution is required which is beyond the ability of 449 MHz profilers to deliver. There will also be occasions (as there have been in the past) when a profiler must be installed temporarily for a research project and then removed, limiting consideration to profilers having antenna dimensions smaller than those used on operational 449 MHz profilers. For these reasons, NOAA has developed and plans to use wind profilers operating on 915 MHz, in the already allocated Government radiolocation band from 902-928 MHz. We consider it reasonable that the private sector may wish to do likewise. In fact, we believe that most non-Government profiler applications will require low-altitude resolution not available in a 2 MHz bandwidth. The fact that profilers built to operate at 915 MHz have a significantly lower cost than those built for 449 MHz is another factor tending to move private operation toward the higher band.

#### Compatibility issues

The NPRM notes that certain objections were raised in response to Radian's petition for a non-Government profiler allocation centered at 915 MHz. Those concerning non-licensed devices require no response, since under the Commission's Rules, these devices are entitled to no protection whatever. To the



extent that the comments of others may affect NOAA's current or future activities, we wish to address their remarks.

As noted previously, the 902-928 MHz band is currently allocated to Government radiolocation on a primary basis. NOAA developed a wind profiler operating on 915 MHz which has received approval from the IRAC's Spectrum Planning Subcommittee. The frequency 915 MHz was subsequently authorized by NTIA for the operation of wind profilers. While NOAA has not yet let a production contract for 915 MHz profilers, it expects to deploy small numbers of such equipment in the next few years.

Whether profilers will operate in the 902-928 MHz band is therefore not at issue; they will. There appear to be two questions remaining open. The first is whether the private sector also sees a need to operate profilers in this band, and Radian's petition appears to answer this in the affirmative. The second is, what steps must be taken to ensure that NOAA's profilers (and other primary services) can operate in this band without harmful interference from users having secondary status or less.

We are not greatly concerned with the possibility of interference to or from radio amateurs. Amateurs have a long and successful history of band sharing with fixed radars, and we believe that coordination procedures similar to those being worked

out for use at 449 MHz can be adapted for this band as well. The Industrial, Scientific and Medical (ISM) systems in this band share with amateur radio the tendency to be located in urban areas. Profilers built in rural locations will have minimal problems with both these services.

Automatic Vehicle Monitoring (AVM) and Part 15 devices are the two remaining types of system which the NPRM lists as being prevalent in the 902-928 MHz band. So far as Government systems are concerned, both operate on a non-interference basis under the Commission's Rules. The planned rural siting of profilers will, never the less, minimize problems for most consumer devices operating in this band under Part 15, since they tend to cluster in urban areas. AVM devices, on the other hand, may well be deployed along rural highways and could run afoul of profilers in this environment. The Commission is currently considering a proposal to expand the frequencies used by AVM systems to include 912-918 MHz, a move which should be carefully studied in light of potential problems with respect to profilers.